Dr.Rajinder S.Aurora et al. International Journal of Recent Research Aspects ISSN: 2349-7688, Vol. 3, Issue 2, June 2016, pp. 32-36

Crop Insurance

Dr.Rajinder S.Aurora[1], Ms. Sarika Rachuri[2]

[1]Professor in Finance, IBS - Mumbai
[2]Faculty in Economics, IBS – Mumbai

Abstract: India is a predominantly agricultural economy. The weakness of this economy is that it is still dependent on the vagaries of monsoon. If the monsoon fails it spells doom in the rural economy that somehow affects the urban economy too. It would not be wrong to say that being an agrarian economy, it is the rural economy that drives India's urban economy. The government has understood this link and appreciates that crop failure can adversely affect the very growth of the Indian Economy. This has actually happened when monsoon has failed on two consecutive occasions and 10states have been under severe drought conditions and crop failure has been massive. The result if the entire economy started suffering due to severe water scarcity and crop failure. The rural expenditure has fallen, causing a decline in rural demand. Looking at this pressure and the overall importance of the rural economy, the government has announced Crop Insurance Scheme to revive the rural demand and helping revive the economic growth. This paper makes an attempt to look at this issue. It also explores the concept of weather derivatives and its significance in Indian context.

Key Words: Crop Insurance, rural economy, indemnity urban economy Inflation, economic Growth, Weather derivatives

I. INTRODUCTION

India is a predominantly agricultural economy. The contribution to the GDP from agriculture is substantial. It makes nearly 14% of our national income, it provides a livelihood to nearly 50 percent people of our country. It is, however unfortunate, that despite our economy, making rapid strides, this sector remains so vulnerable to the vagaries of monsoon. Drought spells and floods are impacting the agrarian economy time and again. Nearly 55 percentages of cultivated area depend on the timely arrival of monsoon. The ground water depletion in areas where irrigation facilities are available too puts further strain. Even areas with irrigation facility are under severe strain as overuse of groundwater has led to fall in groundwater level. Every year India loses huge amounts of Agri-produce due to lack of adequate warehousing and cold storage facilities These have far reaching implications on the agriculture prices and returns on investments from agriculture. Dismal droughts that occurred between 1970 to 2002 reduced agriculture income substantially by nearly 60 to 80 percent (World bank 2012). If the monsoon fails, it spells doom on the rural economy that somehow affects the urban economy too. It would not be wrong to say that being an agrarian economy, it is the rural economy that drives India's urban economy. The government has understood this link and appreciates that crop failure can adversely affect the very growth of the Indian Economy. This has actually happened when monsoon has failed on two consecutive occasions and 10 states have been under severe drought conditions and crop failure has been massive. The result if the entire economy started suffering due to severe water scarcity and crop failure. The rural expenditure has fallen, causing a decline in rural demand. Looking at this pressure and the overall importance of the rural economy, the government has announced Crop Insurance Scheme to revive the rural demand and helping revive the economic growth. This paper makes an attempt to look at this issue.

II. THE GENESIS OF THE PROBLEM

Given the uncertainties in agriculture, it becomes imperative to safeguard the welfare of Indian agriculture against price volatility and have a proper platform for capping risks that arise from such events as floods droughts leading to a crop failure. Risks in agriculture production rise in the entire value chain. The most discernable being the production risk. The production risk is largely triggered by external factors such as droughts, cyclones and catastrophic events. These factors are outside the purview of human or technological intervention. The production risk gets further accentuated with climate change. Climate change is posing catastrophic risks and will continue to influence agriculture production and outcomes in India. Sudden unaccounted climate changes have enhanced production risks on account of greater frequency of loss events, these will have far reaching implications on the yields, crop and prices enhancing the risks for the farming community. At an individual level farmers lack the wherewithal to manage and mitigate such risks.

A large number of studies have estimated that climate change leading to an increase in temperatures will substantially impact agriculture revenue in future, agriculture yields and food security (Sanghi and Mendelsohn 2008),

Low agriculture income abject poverty juxtaposed with a massive crop failures has pushed the farmers towards rural indebtedness and suicides. During 2001 to 2014 there has reported suicide cases of nearly 17,276 farmers on issues ranging from crop failure and resulting inability to repay loans borrowed.

There is a need to design risk mitigating instruments or contracts that will indemnify the farmers from such natural catastrophes. There should be more than one instrument which anchors a stable growth of our agriculture. The government in our country extends its

support against price risk volatility by offering agricultural price support in the form of minimum support prices. However against uncontrollable and unpredictable circumstances crop insurance plays a critical role.

III. OBJECTIVES FOR THE STUDY

Indian Economy is an agrarian economy. It has been estimated that in India, as much as 20 % off
GDP is wiped out whenever there is bad monsoon. The inclement global weather conditions experienced during 2010 have impacted many businesses and industries especially commodities.
The prices that companies pay for commodities have been rising steadily and this in turn affects the prices of inputs and this is finally passed on to consumers and farmers too.
Traditional Tools and techniques have been unable to cope up with the unpredictable weather risk.
This necessitates the need for Weather Risk Management in Indian Agriculture. At this end the Government of India is planning to introduce a bill in the Parliament to permit introduction of weather derivatives in the Indian commodities market. Government of India is planning to introduce in the parliament an amendment to the Forward Contracts Regulations Act to permit introduction of weather derivatives in the Indian commodities market.

IV. OUR STUDY FOCUSES ON:

1. Does India need crop Insurance for supporting the ailing agricultural sector that depends heavily on the vagaries of Monsoon?
2. Analyzing the emergence of weather derivatives as an alternative hedging tool, with the aim of reducing agricultural loss.
3. Various issues related to risk management in agriculture like failure of crop insurance in India, feasibility of weather derivative contracts, etc. are considered.

V. THE RELATED BENEFITS:

One of the effective risk mitigation strategies is crop insurance that facilitates risk transfer. Crop Insurance is an essential element for lowering production risk as part of your agricultural risk management strategy (USDA2010). It helps in socializing the losses. Unlike hedging crop insurance is an ex ante adoption strategy enabling the insured to transfer the risk to the insurance company and is executed when all other precautionary measures fail. The farmers' liability is limited up to a low premium amount. The basic principle underlying crop insurance is that the loss incurred by a few is shared by many in an area. The incidence of risk is distributed to those who can bear the risk. Plenty of empirical research is available that suggests that credit institutions do not provide consumption loans to drought-affected farmers and hence are ill equipped to provide relief during catastrophic times (Jodha 1981).

VI. EVOLUTION OF CROP INSURANCE IN INDIA

The concept of crop insurance is not new in our country but has its origins since 1915 where in the Mysore State the concept of rain insurance scheme was first mentioned. After an Independence lot of studies were commissioned to explore the possibility of crop insurance. However, it was only in the seventies, LIC introduced a crop insurance program for Cotton Growers in Gujarat. Experiments with the scheme were conducted in other states like West Bengal, Tamil Nadu. Later in 1979, A pilot crop insurance scheme was introduced in many states, but the participation was voluntary. This scheme met success and continued till mid-eighties in a few states. This scheme had a large coverage, providing insurance to nearly 6.27 lakh farmers in 13 states. After that throughout the economic history there have been attempts to introduce such crop insurance schemes notable among them are the following:

- Comprehensive Crop Insurance Scheme (CCIS) – 1985
- Experimental Crop Insurance Scheme (ECIS) – 1997
- Pilot Scheme on Seed Crop Insurance (PSSCI) - 2000
- Farm Income Insurance Scheme (FIIS) - 2003
- National Agriculture Insurance Scheme (NAIS)

However, each of these met with a limited success, the success of these schemes have been very low (Venkatesh2008). There were administrative and financial difficulties in the implementation of these schemes (Singh 2010). Low coverage, poor financial performance and delays in indemnity payment have further stalled these schemes. (Raju and Chand, 2008). One key problem in most of the scheme was the unit of assessment. The unit of assessment is either district or a block which glosses over failures at individual levels. The unit of assessment ideally should be a village or a farm. Another pitfall of these schemes has been a high claim / premium ratio. The NAIS claims premium ratio was 340%, which makes these schemes economically unviable. Despite this India has been the largest beneficiary of crop insurance in the world, where less than 20% of farmers are insured in our country. The number of farmer suicide helps us to draw home the point that crop insurance has not proved as an effective tool for risk mitigation. The large number infirmities mentioned above prompted the new government to overhaul the crop insurance scheme to make it more relevant with a far greater outreach and penetration. The heartening fact however is that just, not merely in India, but even the developed world has seen a limited success of crop insurance on account of complexity in deciphering and modeling the risks (Nair 2010).

VII. THE PROPOSED SCHEME

The Proposed Scheme had the following highlights':
1. It was named "Pradhan Mantri Fasal Bima Yojana" earlier known as National Agricultural Insurance Scheme (NAIS) and Modified NAIS (MNIAS).
2. Farmers to pay lower premiums: The farmers were to pay a very low premium. There will be only one premium for each season for all food grains, pulses and oilseeds. This removes all variations in rates across crops and districts

within a season that was capped as Kharif 2% only and Rabi 1.5 % only by the previous government.
3. Then new scheme removes previous capping on premium, so that farmers get the full sum insured. Consequently the claim amounts will not be cut or reduced as was done in the earlier schemes of the UPA government. This it was felt was done arbitrarily by the person appointed to assess the loss.
4. Post harvest losses arising out of cyclones and unseasonal rains are also covered nationally. This was never the case in the previous schemes. The only factor that was taken into account was to ensure no farmer is alone in times of distress.
5. For the first time, post harvest losses arising out of cyclones and unseasonable rains have been covered nationally.
6. The use of digital technology was increased using Remote Sensing Technology, Smart phones and drones are being used for quick estimation of losses & early settlement of claims. This has made the process easier.
7. For the first time, inundation has been included under the localized risk cover.

VIII. HOW IS IT BETTER THAN EARLIER SCHEMES?

1. It is the biggest ever government contribution to crop insurance. An amount of 17,600 crore has been set-aside for the scheme.
2. Under the scheme Pradhan Mantri Fasal Bima Yojana (PMFBY), the state will also provide a matching contribution while farmers will pay only 2 percent of the premium fixed by the insurance company for Kharif food grains / oilseed crops and 1.5 per cent for Rabi food grains / oilseed crops. The premium will be 5 per cent of horticultural and commercial crops for both seasons. This new crop insurance scheme will have lower premiums for farmers in the history of Independent India.
3. There will be no provision of capping the premium rate so as to ensure farmers get a higher claim against the full sum insured. At least 25 percent of the likely claim will be settled directly through farmers' bank account. The new scheme removes previous capping on premium, so that farmers get the full sum insured. Consequently Claim amounts will not be cut or reduced as was done in the earlier schemes of the UPA government. This it was felt was done arbitrarily at the discretion of the person appointed to assess the loss.
4. For the first time, post harvest losses arising out of cyclones and unseasonal rains are also covered nationally. This was never the case in the previous schemes. The only consideration here was to ensure no farmer is alone in times of distress.
5. The use of digital technology was increased using Remote Sensing Technology, Smart phones and drones are to be used for quick estimation of losses & early settlement of claims. This made the claim settlement process easier.
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The Narendra Modi-led NDA-government has finalized the contours of the revamped crop insurance scheme for Indian farmers. The scheme has been welcomed by sector experts who say it can work better compared to the old scheme and would address the problem of farm distress in the country. The Rs 17,600-crore crop insurance scheme that has been cleared by the cabinet on January 13, 2016 aims to cover crop losses due to natural calamities like drought by assuring farmers pay very low premium for the insurance cover. The scheme will be rolled out from the Kharif season beginning June.

This scheme addresses the long pending demand of the farm sector for an insurance scheme. There have been crop insurance schemes in the country for long. This scheme aims to address many as 207 districts in nine states have been hit by drought. As many as 90 lakh hectares of land had been affected due to drought and the affected states had sought relief of over Rs 25,000 crore from the central government. Add to this 302 districts in the country had received 20 percent less rain, which, though not categorized as drought, will affect the farmers in these areas too. Announcing the sop ,as one may call it the PM described the scheme wherein the centre will provide Rs 8,800 crore annually to make up for almost all of the premium for the crop insured, as a **move that will transform the lives of the farmers in a big way, it is being felt**.

IX. ASUMMARY OF COMPARISON BETWEEN THE SCHEME OF UDA AND NDA:

S.NO.	FEATURE	MNAIS	NDA SCHEME - PM CROP INSURANCE SCHEME
1.	Premium Rate	High	Lower than MNAIS- govt. to contribute 5 times that of farmers
2.	One Season – One Premium	NO	YES
3.	Insurance Amount Cover	CAPPED	FULL
4.	On Account Payment	YES	YES
5.	Localized Risk Coverage	Hailstorm, Landslide	Hailstorm, Landslide and Inundation
6.	Poor Harvest Losses coverage	Coastal Areas for cyclonic rain	All India for cyclonic + unseasonal rains
7.	Prevented sowing coverage	YES	YES
8.	Use of technology for Quicker Settlement of claims	Intended	Mandatory
9.	Awareness	NO	YES – target to double Coverage to 50%

Source: www.firstpost.com /business dated Jan 15 16.45

X. THE CHALLENGES:

While the scheme is looked upon as a sure shot way of addressing rural distress that impacts the GDP of the country and leaves the entire economy under stress. The failure of crop insurance scheme can be attributed to the following challenges that successive governments have failed to address.

We identify the challenges as:

1. As far as, the coverage of crop insurance schemes has been too low due to lack of awareness among the farmers. Media reports that, the coverage of **MNAIS** now stands at just 23 %. The government is aiming at 50 percent coverage with the new scheme. This, prima facie, shall be the biggest challenge for the government.
2. Crop insurance sector is bogged down by frauds. According to media report bank officials, insurance officials and farmers are hands in gloves for siphoning off insurance money. The challenge is how to address this issue how is the new scheme going to address this?
3. It is not yet clear what will be the yardsticks the revamped crop insurance scheme will use to assess crop losses. Although the low premium will drive penetration and enrolment and make the insurance scheme viable for insurers, it remains to be seen if the unit for assessing crop loss has been reduced to the village level.

XI. WEATHER DERIVATIVES:

An alternative to crop insurance are weather derivatives .Weather derivatives are financial instruments that can be used by organizations or individuals as part of a risk management strategy to reduce risk associated with adverse or unexpected weather conditions. These come under intangible commodity derivatives. These are in form of financial contracts which are pegged to rainfall, snowfall or temperatures. In USA they have been in vogue since early nineties. Hence the underlying is unique usually a force of mother nature, the underlying asset (rain /temperature /snow) has no direct value to price the weather derivatives. Nearly one seventh of USA economy is subject to vagaries of weather conditions(Challis, 1999; Hanley, 1999)

Unlike crop insurance which is restricted to agriculture weather derivatives have a wider scope. A large number of power companies, gas companies , sports managing company widely use weather derivatives .They are used by farmers to hedge against poor harvests caused by heavy rains during the growing period, excessive rain during harvesting, high winds in case of plantations or temperature variability's in case of greenhouse crops. Most of the weather derivatives are sold in OTC markets but some are also sold on illustrious commodity exchanges like CME (Chicago Mercantile Exchange) and LIFFE (London International Financial Futures and Options Exchange) . Currently, the global market size for weather derivatives is estimated to be US $76 billion.(D'Ecclesia, R. (2013).) The CME Group offers weather risk products related to temperature, snowfall, frost and hurricanes. Temperature contracts are the most traded weather hedge around the world. All the products are designed on the basis of weather conditions in more than 47 countries across the world. Weather derivatives markets are taking-off all across the globe and gaining popularity among all sectors of businesses. Market participants say that around 90% – 95% of global weather derivatives volumes come from the US with Europe supplying the major portion of the remainder. Other countries including Japan, Australia and India have also started trading on weather derivatives [2].(Bruce, R. (2008).)

In an attempt to gauge temperatures, Temperature based indexed have been evolved .The most commonly used are indices are heating degree day(HDD) and cooling degree day CDD. They are one of the most common type of index in weather derivative evaluation. The term HDD represents the period from November to March period the temperature and it is monitored each day and if it falls below the a reference point of 65 degrees Fahrenheit in the U.S., or 18 degrees Celsius outside the U.S. Similarly CDD the number of degrees that a day's average temperature is above 65^{o} Fahrenheit and people start to use air conditioning to cool their homes. In either case a cumulative count is kept of the daily departures from the reference temperature. Such an accumulation can be the basis for a derivative contract which might be structured as an option (call or put) or as a "swap" that is an agreement to pay or to receive payment. These weather derivatives are not just a part of developed world but also in many less developed nations of Africa these are being proposed to combat famines and droughts . Valuations of weather derivatives is a difficult proposition . It is difficult to price the contract as the weather is not a tradable asset. The pricing models are still in the development stage to value the weather derivatives.

XII. WEATHER DERIVATIVES IN INDIAN MARKET:

In a country like India the concept of weather derivatives is relatively new. To begin with weather forecast continues to be inaccurate; the impact of weather on business cannot be estimated accurately. Many pilot programme and initiatives have been undertaken to spread awareness about weather derivatives in India. A consultant from the CIRM (Centre for Insurance and Risk Management) estimated India's OTC (Over the Counter) weather derivatives market is worth around $1 billion. . SEBI is proposing to set up weather derivative products that can be launched on Commodity exchanges. Some of the preconditions require to set up weather derivatives are as under

- Development of a robust commodity futures market. One which will have liquidity, depth and even institutional participation.
- Realistic weather derivative products need to be designed, one that are suitable to Indian farmers/ society.
- Sustainable and attractive pricing of all weather derivative products.
- Proper awareness among Market Participants for understanding the nuances of weather derivatives, proper training and education needs to be imparted

to market participants like farmers, consumers and financial institutions,(Sukhija, K. (2008).) etc[4]

- Developing Necessary Infrastructure like Derivative exchanges, consumer associates, weather observatories and brokers5 (Paul 2013)
- Need to introduce stringent regulatory provisions so that defaulters do not escape unpunished. This is the need of the hour. India needs to put in place a strong regulatory mechanism before we introduce weather derivatives. For Example: the Forward Contract (Regulation) Act at present covers forward trading (derivative) in goods only. The act needs to be broadened so as to permit trading on intangibles like weather parameters, electricity, etc.
- For effective reach, help of the local Gram Panchayats and e-choupals could be taken.
- Weather Derivative awareness should be built amongst the traders and farmers so as to reduce the menacing role of money lenders.
- Technology should be put to full use here. Data Warehouses containing archives of rainfall indexes should be updated so as to be effective.

XIII. IS HEDGING RISK POSSIBLE

Weather derivatives are helps to hedge risks. However there is a need to develop a vibrant commodity futures market.Despite these issues regarding weather derivatives, it remains attractive and flexible tool for risk manager to hedge their risk not only in India but all over the world.

XIV. CONCLUSION

Some aspects of risk mitigation have been analyzed in this paper. Two important tools for risk mitigation are crop insurance and weather derivatives .Crop insurance are immensely beneficial less complicated and are far more easy to implement for the farmers. Weather derivatives on the other hand in the Indian context are very nascent. They have an immense scope and can prove immensely beneficial scope for weather derivatives in India, a number of trading firms are expected to offer customized weather derivative products, and lot more industries are expected to be covered in this net. A farmer's common complaint, "Everybody talks about weather changes becoming a thing of the past with weather derivatives. Weather derivatives like any other exchange traded instrument can serve the purpose of its creation only if it increases in volume and is in demand. Instruments which work in one country may pass or fail in another region. But from the empirical studies conducted in other developing countries and with the success of weather derivatives there, India seems to have the potential to have a weather derivatives market. The key challenge is to educate the farmers about such contracts and their usage.

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